

Babytherm 8004/8010

Electrical Safety Test in the USA and Canada

- according to CAN/CSA - 22.2 No. 601.1 - M90 for the Babytherm 8004/8010
- according to UL2601-1 for the scale SCALE-TRONIC 4002-BT (if available)

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1 Visual inspection of basic unit

- All power cords
- Compare inlet and height adjustment fuses to stated ratings

2 Safety testing Babytherm electronics with Biotek Model 501

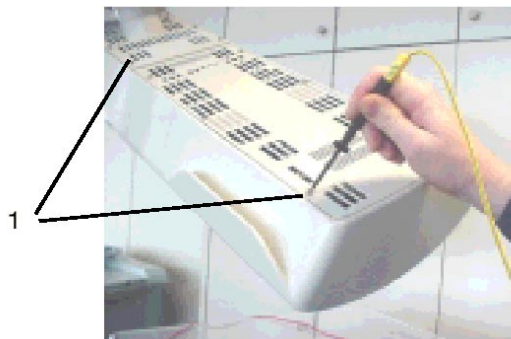
- **Warning:** These tests can expose personnel to hazardous electric shock and must be carried out with caution.
- **Note:** Do not plug the Biotek 501 Pro safety analyzer power cord into a line isolation monitor as inaccurate readings may occur.
- Plug the Biotek 501 Pro power cord into a live AC receptacle, place the power switch of the Biotek 501 Pro to the "1" or ON position and ensure that the keys marked "GROUND", "NEUTRAL" and "POLARITY" are in the NORMAL position.
- **Note:** If the corresponding red LEDs for Ground, Neutral, and Polarity are not lighted, they are in the normal position.

2.1 Chassis Resistance Testing

- Attach the ground lead from the red "Test lead" input to the ground hole of the AC test receptacle on the Biotek 501 Pro. Select the "Single lead" condition by ensuring that the "SINGLE/DUAL" key is not illuminated. Press the gray key marked "RESIST", then press the blue key marked "CAL". When the word CAL is no longer shown in the display window of the Biotek 501 Pro, you may proceed.
- Remove the red lead from the ground hole of the AC test receptacle and attach the alligator clip to the free end, leaving the other end plugged into the red "Test lead" input of the Biotek 501 Pro with the "Single Lead" and "Resistance" conditions still selected.
- Plug the Babytherm power cord from the Electronics (not from the height adjustment or scale) into the test receptacle of the Biotek 501 Pro.
- Unplug the power cord from the Babytherm height adjustment and from the scale.

- Perform 6 tests with the probe attached to the following test items of the Babytherm 8004/8010:

a) Screws (1) on top of the radiant heater



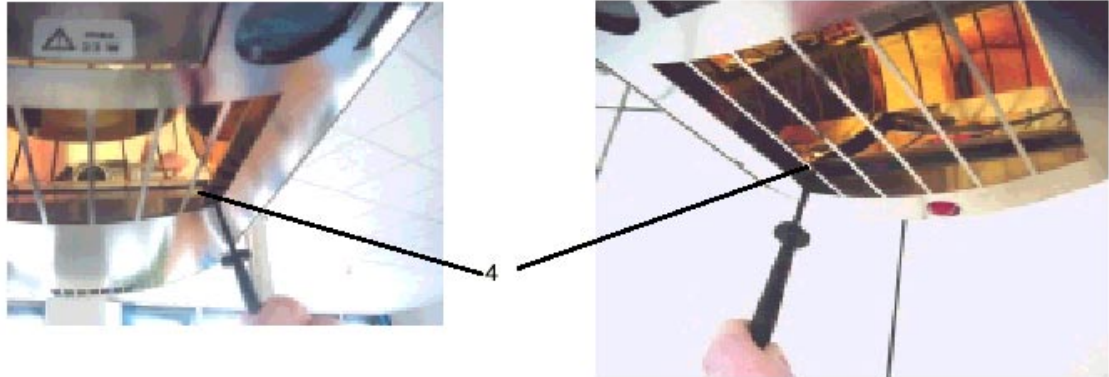
b) Screw (2) of protective screen
(Note: Radiant heater should be in its normal position)



c) Screw (3) of protective screen
(Note: Radiant heater should be in its swivel end position)



- d) Edge of reflector plates of radiant heater
(Note: To avoid damage to reflector plates, measure only at the edges of reflector plates)



- e) Attachment of the control unit
f) Attach probe with an alligator clip to the potential ground stud

- The resistance reading then shown on the Biotek 501 Pro is the "Chassis Resistance". Bend and exercise the power cord to check for intermittent reading.
- Maximum allowable test values:

Chassis Resistance	0.2 Ohm
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- Additional test for the Babytherm 8010 only:
Perform test with the probe attached to aluminum plate of the mattress heating.

Test value for the aluminum plate of the mattress heating:

Chassis Resistance	infinity
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- Afterwards connect probe with attached alligator clip to the potential ground stud.

2.2 Enclosure Leakage Current (Chassis Leakage Testing)

- Press the gray "LEAKAGE" key, leaving all other selections from the previous test the same.
- Switch on Babytherm 8004/8010 and allow the unit to complete the self-test.
- Switch on radiant heater (LEDs on the bargraph on), all lights and Phototherapy option (if available).

- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lighted, they are in the normal position.
- This is a measurement of the leakage current from the Chassis to earth ground.
- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 μ A
Normal Ground, Reverse Polarity, Normal Neutral:	100 μ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 μ A, but not 0 μ A
Open Ground, Reverse Polarity, Normal Neutral:	500 μ A, but not 0 μ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

2.3 Earth Leakage Current (Ground Wire Leakage Testing)

- Remove the red lead with the alligator clip from potential ground stud of the Babytherm 8004/8010.
- Remove the alligator clip from the red test lead and plug this end into the green input jack "GROUND" on the back panel on the Biotek 501 Pro.
- Leave all other selections from the previous test the same.
- The Babytherm 8004/8010 is still switched on.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lighted, they are in the normal position.
- This is a measurement of the leakage current flowing through the ground wire of the power cord.

- Maximum allowable test values under Normal Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 μ A, but not 0 μ A
Open Ground, Reverse Polarity, Normal Neutral:	500 μ A, but not 0 μ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Open Neutral:	1000 μ A
Open Ground, Reverse Polarity, Open Neutral:	1000 μ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Switch off Babytherm 8004/8010.
- Maximum allowable test values under Normal Condition, Babytherm 8004/8010 switched off:

Open Ground, Normal Polarity, Normal Neutral:	500 μ A, but not 0 μ A
Open Ground, Reverse Polarity, Normal Neutral:	500 μ A, but not 0 μ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

Rationale: On/Off switch is a standby switch and the unit has an asymmetric power supply. The earth leakage current in normal condition may be higher with standby switch in off position.

2.4 Patient leakage current from the sensor connection to earth

- Remove the test lead from the Biotek 501 Pro and leave all other selections from the previous test the same.
- Short all pins of the two skin temperature connectors using a shorting plug 79 10 484.
- Plug the other end into the input jack "RA" of the Biotek 501 Pro.
- Select the "ECG LEAK" key on the Biotek 501 Pro.
- Use the Increment or Decrement arrow on the Biotek 501 Pro to select the "RA-Gnd" option.

- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Switch on Babytherm 8004/8010.
- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 μ A
Normal Ground, Reverse Polarity, Normal Neutral:	100 μ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 μ A
Open Ground, Reverse Polarity, Normal Neutral:	500 μ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Switch off Babytherm 8004/8010 and disconnect power cord from the Biotek 501 Pro.

3 Safety testing electrical height adjustment with Biotek Model 501

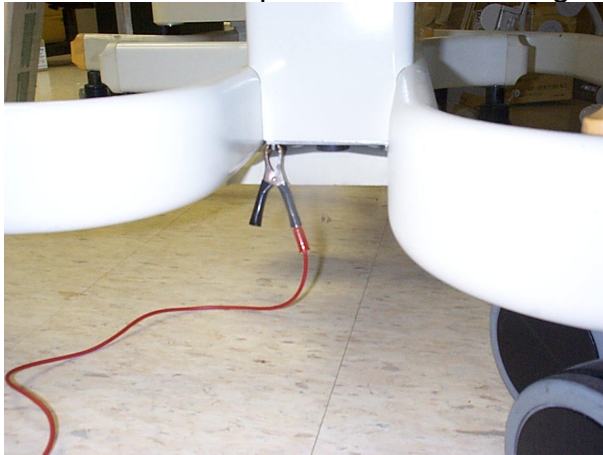
- Please note: The electrical height adjustment is an option.
- **Warning:** These tests can expose personnel to hazardous electric shock and must be carried out with caution.
- Note: Do not plug the Biotek 501 Pro safety analyzer power cord into a line isolation monitor as inaccurate readings may occur.
- Plug the Biotek 501 Pro power cord into a live AC receptacle, place the power switch of the Biotek 501 Pro to the "1" or ON position and ensure that the keys marked "GROUND", "NEUTRAL" and "POLARITY" are in the NORMAL position.
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lighted, they are in the normal position.

3.1 Chassis Resistance Testing

- Attach the ground lead from the red "Test lead" input to the ground hole of the AC test receptacle on the Biotek 501 Pro. Select the "Single lead" condition by ensuring that the "SINGLE/DUAL" key is not illuminated. Press the gray key marked "RESIST", then press the blue key marked "CAL". When the word CAL is no longer shown in the display window of the Biotek 501 Pro, you may proceed.
- Remove the red lead from the ground hole of the AC test receptacle and attach the alligator clip to the free end, leaving the other end plugged into the red "Test lead" input of the Biotek 501 Pro with the "Single Lead" and "Resistance" conditions still selected.
- Plug the Babytherm power cord from the height adjustment (not from the Electronics or scale) into the test receptacle of the Biotek 501 Pro.
- Unplug the power cord from the Babytherm electronics and from the scale.

Perform 2 tests with the alligator clip attached to the following test items of the height adjustment of the Babytherm 8004/8010:

a) Screw at the base plate of electrical height adjustment



b) Potential ground stud of the Babytherm 8004/8010

- The resistance reading then shown on the Biotek 501 Pro is the "Chassis Resistance". Bend and exercise the power cord to check for intermittent reading.
- Maximum allowable test values:

Chassis Resistance	0.2 Ohm
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- Afterwards leave alligator clip at the potential ground stud.

3.2 Enclosure Leakage Current (Chassis Leakage Testing)

- Press the gray "LEAKAGE" key, leaving all other selections from the previous test the same.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lighted, they are in the normal position.
- This is a measurement of the leakage current from the Chassis to earth ground.
- Activate height adjustment during every test.
- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 μ A
Normal Ground, Reverse Polarity, Normal Neutral:	100 μ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 μ A, but not 0 μ A
Open Ground, Reverse Polarity, Normal Neutral:	500 μ A, but not 0 μ A

(According to CAN/CSA-22.2 No. 601.1-M90, Sub-clause 19.3, Table IV)

3.3 Earth Leakage Current (Ground Wire Leakage Testing)

- Remove the red lead with the alligator clip from potential ground stud of the Babytherm 8004/8010.
- Remove the alligator clip from the red test lead and plug this end into the green input jack "GROUND" on the back panel on the Biotek 501 Pro.
- Leave all other selections from the previous test the same.

- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lighted, they are in the normal position.
- This is a measurement of the leakage current flowing through the ground wire of the power cord.
- Activate height adjustment during every test.
- Maximum allowable test values under Normal Condition:

Open Ground, Normal Polarity, Normal Neutral:	500 μ A, but not 0 μ A
Open Ground, Reverse Polarity, Normal Neutral:	500 μ A, but not 0 μ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Open Neutral:	1000 μ A
Open Ground, Reverse Polarity, Open Neutral:	1000 μ A

(According to CAN/CSA - 22.2 No. 601.1 - M90, Sub-clause 19.3, Table IV)

- Remove all test equipment

4 Safety testing SCALE-TRONIC 4002-BT with Biotek Model 501

- Please note: The scale is an option.
- **Warning:** These tests can expose personnel to hazardous electric shock and must be carried out with caution.
- Note: Do not plug the Biotek 501 Pro safety analyzer power cord into a line isolation monitor as inaccurate readings may occur.
- Plug the Biotek 501 Pro power cord into a live AC receptacle, place the power switch of the Biotek 501 Pro to the "1" or ON position and ensure that the keys marked "GROUND", "NEUTRAL" and "POLARITY" are in the NORMAL position.

- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lighted, they are in the normal position.

4.1 Chassis Resistance Testing

- Attach the ground lead from the red "Test lead" input to the ground hole of the AC test receptacle on the Biotek 501 Pro. Select the "Single lead" condition by ensuring that the "SINGLE/DUAL" key is not illuminated. Press the gray key marked "RESIST", then press the blue key marked "CAL". When the word CAL is no longer shown in the display window of the Biotek 501 Pro, you may proceed.
- Remove the red lead from the ground hole of the AC test receptacle and attach the alligator clip to the free end, leaving the other end plugged into the red "Test lead" input of the Biotek 501 Pro with the "Single Lead" and "Resistance" conditions still selected.
- Attach the alligator clip to one of the screws of the housing of the scale electronics.
- Plug the scale power cord into the test receptacle of the Biotek 501 Pro.
- Unplug all other power cords from the Babytherm.
- The resistance reading then shown on the Biotek 501 Pro is the "Chassis Resistance". Bend and exercise the power cord to check for intermittent reading.
- Maximum allowable test value:

Chassis Resistance	0.2 Ohm
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4.2 Enclosure Leakage Current (Chassis Leakage Testing)

- Press the gray "LEAKAGE" key, leaving all other selections from the previous test the same.
- Switch on scale and allow the unit to complete the self-test.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lighted, they are in the normal position.

- This is a measurement of the leakage current from the Chassis to earth ground.
- Maximum allowable test values under Normal Condition:

Normal Ground, Normal Polarity, Normal Neutral:	100 μ A
Normal Ground, Reverse Polarity, Normal Neutral:	100 μ A

(According to UL2601-1, Table IV)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Normal Neutral:	300 μ A, but not 0 μ A
Open Ground, Reverse Polarity, Normal Neutral:	300 μ A, but not 0 μ A

(According to UL2601-1, Table 19.100)

4.3 Earth Leakage Current (Ground Wire Leakage Testing)

- Remove the red lead with the alligator clip from the scale.
- Remove the alligator clip from the red test lead and plug this end into the green input jack "GROUND" on the back panel on the Biotek 501 Pro.
- Leave all other selections from the previous test the same.
- The scale is still switched on.
- Set up the Biotek 501 Pro for the following tests by using the white keys labeled "Ground", "Neutral" and "Polarity".
- Note: If the corresponding red LEDs for Ground, Neutral, and Polarity are not lighted, they are in the normal position.
- This is a measurement of the leakage current flowing through the ground wire of the power cord.
- Maximum allowable test values under Normal Condition:

Open Ground, Normal Polarity, Normal Neutral:	300 μ A, but not 0 μ A
Open Ground, Reverse Polarity, Normal Neutral:	300 μ A, but not 0 μ A

(According to UL2601-1, Table 19.100)

- Maximum allowable test values under Single Fault Condition:

Open Ground, Normal Polarity, Open Neutral:	300 μ A
Open Ground, Reverse Polarity, Open Neutral:	300 μ A

(According to UL2601-1, Table 19.100)

- Switch off scale and remove all test equipment